
**METHOD OF TEST FOR SAYBOLT FUROL VISCOSITY
OF EMULSIFIED ASPHALT AT 25°C (77°F) AND 50°C (122°F)**

SCOPE

This method of test is used for determining the Saybolt Furol viscosity of emulsified asphalt at 25°C (77°F) and at 50°C (122°F).

APPARATUS

- A. Viscometer. A Saybolt Furol viscometer conforming to the requirements specified in AASHTO Designation T-72, except the functional precision of the bath temperature will be $\pm 0.05^\circ\text{C}$ (0.1°F)
- B. Water Bath. 71.1°C (160°F) water bath
- C. Sieve. A $850\ \mu\text{m}$ (20 mesh) sieve or strainer
- D. Suction Pipette. A glass pipette fitted with a rubber suction bulb
- E. Receiving Flask, Timer and Thermometers. The equipment is identical to that specified in AASHTO Design. T-72.

PROCEDURES

- A. Preparation for Test at 25°C (77°F)
 - 1. Allow the viscometer bath to attain room temperature and clean and dry the viscosity tube.
 - 2. Stir the sample thoroughly without incorporating bubbles and pour it into a 4 oz. bottle with cap or a 125 ml. conical flask with stopper.
 - 3. Place the container in a water bath at 25°C (77°F) for 30 minutes and mix the sample in the container by inverting it several times slowly enough to prevent bubble formation.
 - 4. Pour a small portion of the sample through the $850\ \mu\text{m}$ (20 mesh) sieve into the viscosity tube and allow to flow through the outlet tube to waste.
 - 5. Place the cork in position and pour the remaining sample through the sieve into the tube until it is above the overflow rim.

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6. Without again stirring the sample, remove the excess emulsion from the gallery with the suction pipette and determine the viscosity as described under Test Procedure.

B. Preparation for Test at 50°C (122°F)

1. Adjust the viscometer bath temperature to approximately 50°C \pm 0.05°C (122°F \pm 0.1°F).
2. Clean and dry the viscosity tube and insert the cork.
3. Stir the sample thoroughly without incorporating bubbles and then pour about 100 ml into a 400 ml glass beaker.
4. Immerse the bottom of the beaker containing the emulsion about 50 mm (2 in.) below the level of a water bath whose temperature is approximately 71°C \pm 3°C (160°F \pm 5°F).
5. Hold the beaker upright and stir the emulsion with a wide circular motion at a rate of about 60 rpm with the viscosity tube thermometer to obtain uniform temperature distribution. Avoid incorporation of bubbles.
6. Heat the emulsion in the water bath to 51.4°C \pm 0.3°C (124.5°F \pm 0.5°F).
7. Immediately pour the emulsion through the 850 μ m (20 mesh) sieve into the viscosity tube until it is above the overflow rim.
8. Stir the emulsion in the viscosity tube at about 60 rpm with the viscosity tube thermometer, avoiding bubble formation, until the emulsion reaches the test temperature.
9. Adjust the bath temperature until the emulsion temperature remains constant for 1 minute at 50°C \pm 0.05°C (122°F \pm 0.1°F).
10. Withdraw the viscosity tube thermometer, quickly remove the excess emulsion from the gallery with the suction pipette, and determine the viscosity as described under Test Procedure.

C. Test Procedure

1. Place the receiving flask where the stream of emulsion from the bottom of the viscometer will just strike the neck of the flask.
 2. Snap the cork from the viscometer using the attached cord or chain. At the same instant start the timer.
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3. Stop the timer the instant the bottom of the meniscus reaches the graduation mark and record the efflux time in seconds.

D. Cleaning Viscosity Tube

1. Immediately after determining the emulsion viscosity flow time, rinse the remaining emulsion from the viscosity tube with water. Repeat rinsing until the wash water is clear. Catch and retain the wash water.
2. Clean the emulsion that has broken and adhering to the inside walls of the viscosity tube with 1-1-1 trichloroethane followed by rinsing with alcohol. Catch and retain the 1-1-1 trichloroethane and alcohol.
3. Dry the inside of the viscosity tube by passing a slow stream of filtered dried air through the tube until the last trace of solvent is removed. The drying of the tube may also be done by inserting a rolled up paper towel into the tube and wiping away the remaining solvent.
4. Inspect the orifice, making sure it is not obstructed with particles of asphalt residue.
5. Dispose of the retained wash water, 1-1-1 trichloroethane and alcohol by following [I.M. 215](#), Materials - Part 5.

E. Calculation and Report

1. Multiply the efflux time by the calibration factor for the viscometer used.
2. Report the corrected time to the nearest whole second as the Saybolt Furol viscosity of the emulsion, at the temperature at which the test was made.